

Amendments of the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (CURRENTLY AMENDED) Charge pump device containing at least two stages (S), whereby a stage (S) comprises a switch (SW_n) and a charge device (CS_n) which are arranged to generate a voltage higher than a supply voltage (V_{dd}), whereby the stages (S) are arranged in series and a required multiplication factor (MF) of the charge pump (CP) is adjustable by activating/deactivating a definable number of stages (S), whereby the switches (SW_n) of each stage (S_n) are arranged in the same way and comprise a switch MP1 which is arranged between an input (IN) and an output (OUT) of the stage (S), and the charge pump device further comprising:
two transistors MP2 and MP3 for controlling the isolated bulk of the switch (SW_1);
a forth transistor MP4 to charge a boot capacitor (C_B), whereby the boot capacitor (C_B) is arranged for storing the charge to drive the gate of the switch MP1; and
a gate control unit comprising at least one transistor, whereby the gate switch control unit (GSU) is arranged to control the gate of the switch MP1.
2. (ORIGINAL) Charge pump device as claimed in claim 1, whereby for a multiplication factor (MF) smaller than the maximal possible multiplication factor (MF_{max}) the stages (S) beginning from an input (IN) of the charge pump (CP) device will be deactivated.
3. (CANCELED)
4. (CURRENTLY AMENDED) Charge pump device as claimed in claim 31, whereas the switch MP1 is preferably realized as isolated bulk transistor.
5. (CURRENTLY AMENDED) Charge pump device as claimed in claim 31, containing a level generation unit (LGU) for providing control signals for the gate switch control unit (GSU).

6. (CURRENTLY AMENDED) Charge pump device as claimed in claim 31, whereby the gate switch control unit (GSU) is foreseen to connect or disconnect the gate of the switch MP1 transistor from the C_B capacitor.

7. (CURRENTLY AMENDED) Charge pump device as claimed in claim 31, whereby the gate switch control unit (GSU) is arranged to provide control signals to the switch (SW) of the stage (S) in case of voltages below V_{dd} .

8. (CURRENTLY AMENDED) Display driver (DD) for providing display information and voltages to a display unit (DU) with a charge pump (CP) device containing at least two stages (S), whereby a stage comprises a switch (SW_n) comprising a switch MP1 which is arranged between an input (IN) and an output (OUT) of the stage (S), a gate switch control unit comprising at least one transistor and a charge device (CS_n) which are arranged to generate a voltage higher than a supply voltage (V_{dd}), whereby the stages (S) are arranged in series and all stages (S) are realized in the same way and a required multiplication factor is adjustable by activating/deactivating a certain number of stages (S), the charge pump device further comprising:

two transistors MP2 and MP3 for controlling the isolated bulk of the switch (SW_n); and a forth transistor MP4 to charge a boot capacitor (C_B), whereby the boot capacitor (C_B) is arranged for storing the charge to drive the gate of the switch MP1; and wherein the gate switch control unit (GSU) is arranged to control the gate of the switch MP1.

9. (CURRENTLY AMENDED) Display module (DM) having a display unit (DU) and a display driver (DD) with a charge pump (CP) device, containing at least two stages (S), whereby a stage comprises a switch (SW_n) comprising a switch MP1 which is arranged between an input (IN) and an output (OUT) of the stage (S), a gate switch control unit comprising at least one transistor and a charge device (CS_n) which are arranged to generate a voltage higher than a supply voltage (V_{dd}), whereby the stages (S) are arranged in series and all stages (S) are realized in the same way and a required multiplication factor (MF) is adjustable by

activating/deactivating a certain number of stages (S), the charge pump device further comprising:

two transistors MP2 and MP3 for controlling the isolated bulk of the switch (SW_n); and
a forth transistor MP4 to charge a boot capacitor (C_B), whereby the boot capacitor (C_B) is
arranged for storing the charge to drive the gate of the switch MP1; and
wherein the gate switch control unit (GSU) is arranged to control the gate of the switch MP1.

10. (CURRENTLY AMENDED) Telecom terminal having a display module (DM), a display unit (DU) and a display driver (DD) with a charge pump (CP) device, containing at least two stages (S), whereby a stage comprises a switch (SW_n) comprising a switch MP1 which is arranged between an input (IN) and an output (OUT) of the stage (S), a gate switch control unit comprising at least one transistor and a charge device (CS_n) which are arranged to generate a voltage higher than a supply voltage (V_{dd}), whereby the stages (S) are arranged in series and all stages (S) are realized in the same way and a required multiplication factor (MF) is adjustable by activating/deactivating a certain number of stages (S), the charge pump device further comprising:

two transistors MP2 and MP3 for controlling the isolated bulk of the switch (SW_n); and
a forth transistor MP4 to charge a boot capacitor (C_B), whereby the boot capacitor (C_B) is
arranged for storing the charge to drive the gate of the switch MP1; and
wherein the gate switch control unit (GSU) is arranged to control the gate of the switch MP1.